

It's almost time to look for Venus

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Venus is always brilliant and shining with a steady, silvery light, not twinkling like a star. It appears in the western sky from Jan. 1 through March 16 at dusk and in the eastern sky at dawn from April 3 through Nov. 13.

Viewed with the naked eye, it may appear like a bright star, but with binoculars or telescopes, its phase changes become obvious, making it a favorite of astronomers.

If you watch Venus over a period of time and record the phases, ranging between a thin crescent to full, you will be replicating the observations of Galileo from late 1609 through early 1610. The full cycle from new to full to new again takes 584 days. This is the time it takes for Venus to over-

take Earth in its orbit. It was this observation of phases of Venus that lead Galileo to deduce that heliocentrism was correct, and that the planets circled the sun.

Galileo did not invent the telescope, but he was the first to use it systematically to observe celestial objects and record his discoveries. "Spyglasses" had been fabricated in Holland in the early 17th century. Galileo perfected the telescope and improved its magnifying power to 20x.

With this new tool and analytic approach to observation, Galileo observed:

- The surface of the moon grooved by mountains and valleys.

- Jupiter surrounded by satellites he called the Medicean Stars, named after his financial sponsor, Cosmio II de' Medici. Jupiter's

four largest moons are Io, Ganymede, Callisto, and Europa.

- Venus showing cyclic phases like the moon.

- The sun's surface featuring dark spots.

- Saturn bulging strangely at the sides—the rings!

After the power of the telescope was recognized, an era of ever-improving optical instruments was ushered in. They had impressive dimensions and increasing magnification power. Galileo's astronomical discoveries began a revolution that would demolish an earth-centered image of the universe that had lasted 2,000 years.

Galileo had wide-ranging interests and made significant contributions in astronomy, physics, engineering, philosophy and mathematics. He was a central figure in the transition from natural phi-

losophy to modern science. Most broadly, he has been described as the "father of the scientific method," since he developed the idea of making observations, hypothesizing, and then experimenting to test the hypothesis.

The crew of space shuttle Atlantis were members of the fifth and final space shuttle mission to refurbish and repair the Hubble Space Telescope. The launch occurred on May 11, 2009, with its crew of seven astronauts aboard. The Hubble Space Telescope has contributed more to man's understanding of the universe than any tool since Galileo's leap forward in 1609.

It was fitting that once in space, the Atlantis astronauts celebrated the 400th anniversary of Galileo's celestial discoveries by pointing to the stars a replica of his original telescope.